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## The Tree Palms of the United States.

A NUMBER of Palm-trees live on the southern borders of the United States, adding special interest to the forest flora of this country, which, rich in many forms of the common trees of the northern hemisphere and in many special and peculiar types, is extraordinary in the variety of its composition and in the size and beauty of its individuals.

Of these Tree Palms of our country the best known is the Cabbage Palm, or Cabbage Palmetto (Sabal Palmetto), of the coast region of the south-eastern states, where in the immediate neighborhood of the sea it ranges from an island off the mouth of the Cape Fear River in North Carolina to southern Florida, and along the Gulf coast to the Apalachicola. This tree is interesting to botanical geographers as the most northern arborescent Palm in the world; and probably nothing so delights and instructs northern travelers in the south as their first introduction to a grove of these plants. The large terminal leaf-bud of this tree and of many other Palms is cooked as a vegetable—a fact to which it owes its common name. The custom is an extravagant one, as the removal of the bud, which is never replaced, kills the tree, and as young vigorous trees produce the most succulent buds it is rather remarkable that the species has escaped extermination in a region abounding in negroes who are credited with a special fondness for cabbages which can be had without agricultural forethought or labor. But if it has survived the vegetarian it will not long survive the maker of scrubbing-brushes, who now uses the fibres of the sheaths of the young leaves in his industry. To obtain his material the top of a young plant with its bud is cut off, trimmed down to a disk of about eight inches in length, and then, after the soft edible core has been removed, boiled to separate the fibres. The removal of the top kills the plant, as we have already said, and as one concern in Jacksonville, Florida, alone consumes 7,500 buds a week, the time is not very far distant when the Sabal Palmetto will become a rare tree. The buds, which are now mostly procured from the west coast of Florida, where the Palmetto is most abundant, are worth at the mill only six or seven cents each, and it is not probable that the extravagance and wastefulness of this brush industry is exceeded by that of any other in the United States.

A rude stockade made of the stems of the Palmetto on one of the islands in Charleston harbor, and manned by less than a hundred Americans under Moultrie, repulsed, on June 28th, 1776, Sir Peter Parker's British fleet and decided the fate of the Carolinas. A year later South Carolina placed on her official seal, in memory of this victory, a Palmetto erect, emblematic of its strength, and below it an Oak-tree torn from the ground and shorn of its branches to recall the fate of the oaken ships of her oppressors; and the Palmetto state took her place in the Union. In these days the trunks of this Palm are found as serviceable against the attacks of the teredo as they were in withstanding British shot, and make excellent wharf-piles for our southern coast.

A second arborescent Sabal enters our territory. This is Sabal Mexicana, a tree which is widely scattered along the Gulf-coast of Mexico and, crossing the Rio Grande, follows its Texas bank for a distance of some thirty miles from the coast, growing to a height of fifty feet on the rich bottom-lands of the river, where it is associated with the Texas Elm, the Texas Green Ash, the Mimosa and other trees peculiar to that region. In habit it resembles the Carolina Palm, but the leaves are rather larger, the flower-clusters are three or four times longer, with stouter branchlets, and the seeds are more than twice as large and much darker in color. In Texas the leaves of this tree are cut off almost as fast as they appear, being highly prized as thatch for buildings. It is occasionally planted as a street tree in the towns along the lower Rio Grande, and in some of the Mexican states this Sabal is regularly cultivated to produce leaves from which cheap straw hats are made in great quantities.

The third of our arborescent Palms inhabits the Colorado Desert in southern California. Found by the Jesuit missionaries, who settled in California, on the low shores of the depression of the desert which once held the waters of a great arm of the sea, the Washingtonia was taken to decorate the gardens of their southern missions. Some of these mission trees have now grown to a great size, and not long ago two of them standing near an old well in San Pedro Street, Los Angeles, were nearly one hundred feet in height, with trunks nine feet in diameter at the base. Specimens of such a size are rare, and on the desert and in the dry mountain cañons which this species selects for its home, and where it is subject to the constant hardship of drought, wind and fire, it is rarely more than fifty or sixty feet tall. Nature, in thatching the trunk with a thick cone of dead pendent leaves extending from the base of the living crown of foliage nearly to the ground, has furnished Washingtonia with the best possible protection against the drying winds of the desert. But, unfortunately, this thatch, which becomes as dry as tinder, is very inflammable, and usually falls a prey to the fires of Indians who find that it prevents them from climbing the tree to gather the fruit, or of untaught white men who enjoy the sight of the mass of dead leaves disappearing in a flash of flame. The tough outer rim of the trunk, fortunately, does not burn easily, and through uncounted ages Washingtonia has survived hardships of environment and the vandalism of man from a time, perhaps, when its broad and splendid crown of foliage was reflected in waters which have disappeared with its less robust and enduring forest companions. But, whatever may have been its history and its hardships in the past, the lines of Washingtonia have at last fallen again in pleasant places, and, nourished by the waters of limpid mountain streams, it is growing now in countless thousands in all the gardens and parks of southern California; and in all the countries of southern Europe this lonely denizen of the desert has become a rival in stately beauty of the Palms of every semitropical country.

Washingtonia is now known to contain a second species, an inhabitant of western Sonora and Lower California, and very like our California tree, except in some unimpor-

tant botanical characters and in its more slender habit and smaller size. First considered a species of Pritchardia by Wendland, the German authority on Palms, our California Palm was afterward made the type of his genus Washingtonia. Some later students of the Palms have now united Washingtonia again with Pritchardia, but the structure of the flower with its free stamens, the armed petioles, and its geographical distribution appear sufficient grounds for considering Washingtonia generically distinct.

The two Sabals and the Washingtonia are the only Palms which belong to the flora of North America, and one of the Sabals, which only just enters our territory, is really Mexican. The other arborescent Palms in the United States are all tropical species and are confined to the shores and keys of the extreme southern part of Florida which are covered by a purely tropical vegetation, and where three genera are represented.

The first of these is Oreodoxa, an American genus of about four species. Three are lofty trees, the loftiest, perhaps, of all the American Palms, and true princes of the vegetable kingdom, while the fourth is a humble inhabitant of the high slopes of the Andes of Ecuador, only remarkable as one of the most alpine of all Palms. The largest species, Oreodoxa oleracea, the Cabbage Palm of the Antilles, sends up a slender trunk nearly two hundred feet in height, surmounted by a long, green, polished cylinder of petiole sheaths and a crown of long, arching, graceful, pinnate leaves frequently twenty feet long and six feet wide. Its tall pale stem and beautiful head make this Palm a favorite in gardens, and it is planted in all tropical countries and often in long and stately avenues, as in the Botanic Garden of Rio de Janeiro, which owes its fame to its Palm avenue. Economically, Oreodoxa oleracea is one of the most useful of the American Palms. The bud of young leaves, like that of the Palmetto, is eaten as a vegetable; the sheathing bases of the leaf-stalks, which are eight or ten feet long, are used by the negroes as cradles, and are split into surgeons' splints; from the inner coat of these sheaths vellum-like paper is made, and mats are manufactured from their fibres. A kind of sago is obtained from the pith of the stem, and oil is pressed from the seeds. The long stems are split longitudinally and, freed of the spongy interior, are used as gutters, while from the hard rind-like exterior rim beautiful canes and many small objects are made. Another West Indian species, Oreodoxa regia, the Royal Palm, is a tree often one hundred feet high, with a trunk which is often largest near the middle, but otherwise generally resembles the Cabbage Palm and is equally graceful and beautiful. This species, which is common in Cuba, extends into southern Florida, where it inhabits two or three hummocks on Rogue's River, about twenty miles east of Caximbas Bay on the west coast, Long's Key and the shores of Bay Biscayne near the mouth of Little River. The presence of a lofty Palm in southern Florida was hinted at more than sixty years ago, and the fact is mentioned in the preface to Nuttall's *North American Sylva*, but it was not until 1859 that this Palm was known to be Oreodoxa regia. In that year Dr. Cooper found it on Bay Biscayne, and twenty years later Mr. A. H. Curtiss established the fact of its presence on Rogue's River and Long's Key.

The portrait of a young tree of this species near the shores of Bay Biscayne appears in our illustration on page 155 of this issue. It is made from a photograph for which we are indebted to Mr. James M. Codman, of Brookline, Massachusetts; and, although it does not display the loftiness of the full-grown tree, it shows the slender stem and graceful head of the most beautiful of the Palms of the United States.

The next genus, Pseudophœnix (see vol. i., p. 353, fig. 55), is monotypic and confined to two of the southern keys. It is a small and not particularly handsome tree, with long, arching, pinnate leaves and large orange-scarlet, usually three-lobed, fruits. The flowers of this species, of which there are probably not more than two or three hundred individuals in existence, unless it grows elsewhere than in Florida, are still unknown.

The last of our genera, Thrinax, is exclusively West Indian and Floridian, with a few species of small trees and shrubs distinguished by large handsome fan-shaped leaves often silvery white on the lower surface, minute flowers, with calyx and corolla confluent into a short cup, and small fleshy or dry fruits. The Florida species are not well known, and there are probably four arborescent species on the keys, although at present no other North American trees are so little known as this group of Palms.

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At a recent meeting of the West Virginia Academy of Science a committee was appointed consisting of Dr. A. D. Hopkins, Chairman; Dr. J. L. Goodknight, President of the West Virginia University; Dr. J. A. Myers, Director of the West Virginia Agricultural Experiment Station; Judge Okey Johnson, Dean of the Law Department of West Virginia University, and L. C. Corbett, Professor of Agriculture and Horticulture, West Virginia University, to inquire into the subject of forest protection, and draft bills for the establishment of a system of forestry reservations in the middle Alleghenies; the bills to be submitted to Congress and the state legislature.

The committee state that by referring to a map it will be seen that there is an area in the middle Allegheny Mountains, principally in West Virginia, but extending through a portion of Maryland and Virginia, and into Pennsylvania and North Carolina, in which the sources of a number of important rivers are found, namely, the Monongahela, with its tributaries; the Elk, Gauley, Guyandotte and Big Sandy, all of which belong to the Ohio River system; the principal tributaries of the Potomac and James, and also the source of the Tennessee River. In addition to this important system of river sources, the region embraces possibly a million and a half acres of virgin forest, with a considerable area of cut-over brush and waste land. Much of the continuous forest area lies in large bodies, and consists largely of Black Spruce, Hemlock, White Pine and valuable hardwood timber, making it a region of extreme importance, not alone to the states in which it occurs, but to the entire region drained by the several rivers mentioned, embracing a large portion of the United States east of the Mississippi River.

It is, therefore, evident that the protection of the forests in this region is a matter worthy of consideration by the Secretary of the Interior, the Forestry Inquiry Commission of the National Academy of Science, the Rivers and Harbors Committee of Congress and the Representatives in Congress from West Virginia, to whom resolutions have been sent reciting the dangers to the forest and recommending prompt action.

The committee further states that it will hold itself in readiness to furnish, as far as may be, any information regarding the region embraced in West Virginia, and will gladly coöperate with other academies of science, scientific and forestry associations and individuals, in obtaining and presenting facts bearing upon the subject. We need hardly add that we are in full sympathy with this movement. This journal has repeatedly advocated the establishment of a reservation to preserve a portion of the southern Appalachian forest, so rich in the variety and magnitude of its trees and so incalculably valuable from its position.

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## Some Native Ornamental Grasses.—I.

In the temperate zone grasses are, next to forests, Nature's chief decorative material. With them she covers the dark earth and colors half the landscape. But apart from their æsthetic value when growing together in meadow or greensward, individual grasses have a beauty that is not half appreciated. For grace of form and delicacy of coloring many of our native grasses are full worthy of cultivation, although but few of them have received the

attention of the horticulturist. To many gardeners Arundo Donax, Miscanthus Sinensis (Eulalia Japonica) and Pampas-Grass, all foreigners, represent the sum total of what is beautiful among these plants. Ribbon-Grass, Phalaris arundinacea picta, is occasionally seen in old gardens. Hair-Grass, a species of Aira; Quaking-Grass, a species of Briza; Sea Oats, Uniola paniculata, and Hare's-tail, Lagurus, are still sometimes grown for "winter bouquets." Some small grasses are now and then used for edgings. With these the list of widely cultivated ornamental grasses is practically closed. But any one who keeps his eyes open may find about him, in field and swamp and woodland, species quite as handsome as any of these and as worthy of a place in garden and lawn.

There are some strikingly ornamental species of Crown-beard or Broomsedge, Andropogon. The Silvery Broomsedge, A. argyræus, common in dry fields in the south-eastern states, is one of these. With its heads of silvery white bearded spikes, it is a very showy grass. Indian-Grass, or Wood-Grass, A. nutans, is another species that might, with cultivation, lend itself to decorative purposes. It is often met with in glades and along the edges of woods. In autumn the tall, straight stems bear handsome open panicles of silky brown spikelets. These grasses are relatives of the Indian A. squarrosus, whose root-stocks furnish the aromatic perfume, vitivert. None of our native Broomsedges appear to have this quality, although a member of a related genus, Elionurus tripsacoides, found in low Pine-barrens along the Gulf coast, has the vitivert fragrance. Another species of Elionurus, E. barbiculmus, is a pretty grass, native of the arid uplands of the far south-west. It has fine thread-like leaves in tufts and slender bright white hairy spikes.

Nearly all the species of Erianthus—a group related to the sugar-cane—are handsome plants. The Old World Erianthus Ravennæ is sometimes seen in cultivation. There are several in the south Atlantic and Gulf states, growing mostly in swamps. E. alopecuroides is the largest of these, while E. contortus—so named from its twisted awn or beard—is, perhaps, the most beautiful. It is a tall grass with a dense, pinkish panicle, which has a silky lustre due to the soft hairs on the spikelets.

Gama-Grass, Tripsacum, is a large plant of the eastern United States, more common southward. It has tall culms or stems and broad, ribbon-like dark green leaves resembling those of Indian Corn, to which it is close akin. It was formerly much esteemed as a forage-producer. The "head" is rather curious than beautiful, consisting of one to three spikes, which are very hard when ripe and break up into several joints. In the southern states it is often planted in cemeteries.

Indian or Tuscarora Rice, Zizania aquatica, sometimes known as Water Oats, is common on the muddy banks of tidal rivers near the Atlantic and about lakes and ponds in the north-west. The fruits are much relished by water-fowl of various sorts, and the seeds are on that account often sown. As it is a large showy grass, and of a decidedly odd appearance, it is very suitable for planting about artificial lakes. Another grass worth cultivating in such places is the Catch-fly Grass, Leersia lenticularis, a near relative of rice. It is a native of deep swamps in the south-eastern states. The broad leaves are often striped with white, as in Ribbon-Grass. The round, flattened spikelets are fringed with stiff bristles like those on the leaves of Venus' Catchfly. To this resemblance, rather than to any ability of its own to capture insects, it doubtless owes its popular name. Carolina Water-Grass, Hydrochloa, inhabits pools and streams in the Pine-barren region of the south Atlantic and Gulf states. The slender stems root in the mud at the bottom, while the short leaves, purplish underneath, float on the surface. At flowering time the whitish spikelets are thrust above the water. This grass has flowered in the ponds of the Fish Commission at Washington and might be grown in ornamental pieces of water, though it would probably not prove hardy much farther northward. As one of the few purely aquatic grasses it is something of an oddity.

The Triple-awn Grasses, Aristida, are often of very attractive appearance. One of the showiest is A. spiciformis, a denizen of Pine-barren swamps near the coast from North Carolina to Florida. It has a conspicuous spike-like head, densely bearded with pale green awns. A. purpurea, abundant in the prairie region, is a handsome plant with very long purple awns. The related Feather-Grasses, species of Stipa, are nearly all of them ornamental. In New Mexico and Arizona occurs a variety of the Old World Stipa pennata, the true Feather-Grass, which has its long bent awns beautifully plumed, like the tails to the fruits of Clematis. S. Kingii is a singularly delicate little grass, and S. Richardsoni is remarkable for the grace of its panicles. The best known of the Feather-Grasses is the Porcupine-Grass, S. spartea, whose long-awned, sharp-pointed seeds do great injury by working into the flesh of sheep. S. viridula robusta, a tall plant with a long greenish panicle, is widely known in the west as Sleepy Grass, and is said to act as a narcotic poison upon stock eating it.

Department of Agriculture, Washington, D. C. *T. H. Kearney, jr.*

## Alpine Plants and some of their Peculiarities.

THE vegetation which thrives on high altitudes, whether on the Swiss Alps, the American Andes, the Himalayas or on the mountains of Oceanica, shows a distinct personal character, noticeable even to the most indifferent of travelers. There plants are usually stunted, short-stemmed or stemless, with flowers relatively exaggerated in size, whereas on the plains, tall herbs with highly developed and luxuriant foliage bear insignificant blossoms, generally smaller than the leaves. On the mountain tops everything is different, the large flowers are almost sessile, with scarcely apparent and only slightly developed foliage, which at a very high level is often clothed with a fine close down, so as to better withstand the effects of cold nights. In many cases the foliage is glabrous, when it is also usually coriaceous (with tissues especially adapted to resist the frosts of alpine climates), and the leaf of a firm, close, thick texture is provided with a solid epidermis and covered with a waxy coating which enables it to withstand the effects of the sun as well as those of an excess of humidity.

Species that grow in the shade and in well-protected spots show neither the one nor the other of these characters. Their foliage is soft and delicate, whereas such woolly plants as the Edelweiss, several species of Senecio, Artemisia, etc., as well as species having smooth, generally thick and glossy leaves, as, for example, the Alpine Azalea, Azalea procumbens, and the Alpine Rose, Rhododendron ferrugineum, are usually encountered on arid, unsheltered slopes. Another fact soon noticed is, that while the flora of altitudes exposed to the heat of the sun generally produces large, brilliantly colored flowers, that of shady situations on the contrary shows very small, pale blossoms, often entirely out of proportion to the size of the plant. The influence of the sun and its effect on vegetation is here more striking than elsewhere.

Annual species, so abundant at lower levels, are but rarely met with on alpine zones. There the very short summer granted to them will not permit of their accomplishing the complete cycle of their existence in a single season. The only alpine species that are not perennial are a few species of Pedicularis and some of the Gentianaceæ.

Alpine plants are always branched from the base, with perennial root-stock and stems spreading on the ground, from which the plant seems to seek the much required protection against the inclemency of the nights and the severe days that are but too frequent during the short summer that is accorded to them. Species that on the plains form shrubs, and even majestic trees, are represented on the mountains by dwarfed ones, which decumbently spread, often rise only a few inches above the ground. Salix, Azalea procumbens and Betula nana are good illustrations of the stunting effect of alpine climate. The presence of curiously constructed little plants is often noticed along the fissures of rocks, small round cushions, composed of a multitude of tiny rosettes closely crowded together and covered with minute imbricated leaves that perish through the winter, and during the flowering season are so densely covered with a profusion of sessile corollas that the foliage entirely disappears under the wealth of flowers. In the clear light of our Alps these tufts of brilliant blossoms produce a marvelous effect, enlivening the rocks and arid sands

and giving a unique aspect to the vegetation of our mountain summits.

All the activity and energy of the plant is brought to bear on the development of the flower with its reproductive organs. It is easy to understand, considering the conditions under which they thrive, that alpine plants should require sometimes several years to accomplish the cycle of their existence and that they need more than a single season in which to produce flowers and seeds. I have devoted much time and care to the study and observation of the gradual growth of alpine plants, and I am sure that certain large tufts of Androsace Helvetica and A. pubescens, for example, have had more than a hundred years of life. It is not hard to realize that the difference of climate should materially alter vegetable forms. Our humid, relatively short and warm winters, with the slow intermediary spring season, followed by a hot dry summer, admits of the gradual development of stems and leaves, and forms a violent contrast to the climate of higher regions. There the winter lasts nine months, or often more (as in certain narrow valleys which are filled with snow frequently for years at a stretch), and is followed suddenly by a short summer that is in every way entirely favorable to rapid vegetable growth. As soon as the snow melts, owing to the influence of the foehn, the sirocco or other warm currents of air usually prevalent in the mountains, the tawny color of the old decaying vegetation changes rapidly in a few days, sometimes in a few hours, to a brilliant green. As if by enchantment, the fields and rocks become animated, are clothed with verdure, and everywhere the beneficent fertilizing insects busy themselves over flowers which, without their friendly interference, would remain sterile. Some plants are so impatient to unfold their blossoms that they cannot wait for the melting of the surrounding snow, but push their flowers up through it, piercing it easily, thanks to the dark color of their stems. This is often observed on alpine pastures in the cases of Soldanella and of the Crocus. But one questions how can that be if the plant has remained dormant for eight or nine months. To which the answer is, that the plant has been far from inert during the winter, because, if it were so, it could not survive. Life and action continue, sap and juices move, but slowly, and the plant undergoes a gradual growth, the proof of which is as follows: On the eastern slope of the Jura I have studied a tuft of Soldanella for some successive seasons. My first observation was made during the last of October, as the winter was about to set in, and the next day snow was falling rapidly, preparatory to covering the ground for six long months. The little plant had reached maturity, its sap was retreating into the roots and it seemed about to die. At the first note of springtime I returned to the locality and carefully brushed the snow from the spot noted the preceding fall, and found the plant alive, showing flower-buds, though still very small, in the centre of the little tuft. It had developed its buds in the same way that the trees on the plains do theirs even during the most rigorous of winters. The life of the plant is not reduced to as dormant a state as is generally supposed to be the case, which the breaking through of the snow by the early flowers of the Soldanella and the Crocus readily goes to prove. As is well known, the activity of the roots (and those of alpine plants are very numerous) is concentrated almost exclusively on the reproductive organs. The development of the foliage, which contains the organs of respiration, is generally remitted to the latter part of the summer, during and after the maturity of the seeds. After the long winter's rest the plant enters into a prodigious and astonishing activity. The summer days are of fourteen or even of sixteen hours of consecutive duration of intense pure light; the sun is hotter there than at lower levels and water is plentiful, whether in liquid form or in that of vapor. An abundance of light, an adequate amount of humidity and a profusion of roots and rootlets are the sources of life that keep these little plants in action.

Let us now examine the conditions that cause the dwarfing of alpine plants. In the first place, physiological experiments have proved that it is during the night that the lengthening of tissues and the gradual expansion of the plant occurs. In the daytime, the greater the insolation, the less growth they accomplish, and the alpine night being so extremely cold, there can scarcely be a question of nocturnal development of mountain plants. It is under the influence of attenuated solar rays and during the warm dusks that the plants are able to increase. The powerful, exceedingly hot sun of high altitudes causes the brilliancy and size of the corollas, but also prevents the equal expansion of stems and leaves. These latter have only the very short space of time between the setting of the sun and the beginning of the glacial night for their growth, and consequently they also profit by the short, cloudy, moist and tepid days that precede the setting in of winter to put forth new leaves and buds. This is the general rule, though there are scattered exceptions to it.

The flora of polar countries has a very different aspect from that of our mountains, though it has many species common to both. There the sunlight is less intense, as well as more constant, lasting as it does for half of the year, but it is also more diffuse, the solar rays being forced to pierce a much thicker atmospheric stratum, and consequently the stems of plants are more highly developed, floral colors are paler, the foliage is less rigid and thick, and the blossoms are smaller.

I have preserved in my herbarium some specimens of plants common to both arctic and alpine regions, and the same species show a very different form as found growing in the Swiss mountains and in the boreal zone. Silene acaulis with us is truly stemless and the flowers are sessile, while in Lapland the name no longer applies, as there the much smaller flowers are borne on peduncles measuring as much as ten centimetres. There are also other causes that go to explain compression of form in the vegetation of higher altitudes. Extreme violence of storms and winds would destroy anything that did not cling close to the soil, and icy nights force the plants to seek shelter from the earth, which retains more heat than the air. Later the extreme dryness of the atmosphere again obliges them to look for protection from the ground, as the heavy dews that provide the necessary amount of humidity required for their existence are preserved in its light and porous soil. This same mountain soil is entirely different from that of the level country, and is light, very porous and composed of decayed vegetation and the pulverized rock common on the mountain. That rock, whether calcareous or granitic, gives a chemical character to the earth that greatly influences the plants which thrive on it. There is a flora of granitic regions, another of calcareous or siliceous regions, and that especially so on high mountains, as the alluvial soil of the plains is too great a mixture for any appreciable influence to be felt.

Director of the Alpine Garden at Geneva. *H. Correvon.*

## Foreign Correspondence.

### London Letter.

Calpurnia aurea.—This is the Natal Laburnum of residents in south Africa, with whom it takes the place of the common Laburnum of gardens in more temperate regions. It has been in cultivation in a sunny greenhouse at Kew for the last ten years, and is now a small tree about nine feet high, with the habit, foliage and flowers of the common Laburnum, the main difference being in the smaller flowers of the Natal plant. For countries where the temperature is too high for the common Laburnum the Calpurnia would be valuable. It grows freely from cuttings.

Cytisus proliferus is a shrub indigenous to the Canary Islands, of which seeds were distributed from Kew in 1879 to Australia, India, etc., on account of its leafy branches being useful as fodder. "Its great value is manifest from the fact that it requires no irrigation, that it can grow in comparatively barren land and that its branches can be cut off three times during the year, resisting perfectly well a long dry summer." Sheep are said to be very fond of it and to thrive well when fed upon it; it is also reported to be good for and relished by cattle and horses. In Australia it is said to feed animals into condition more rapidly and in a greater degree than any other food except corn, and it grows rapidly in any kind of soil, growing to a height of twelve feet or more in four years from seed. It flowers freely from May to September and is a favorite with bees. Dr. Schomburgk wrote in 1891 that he "considered it to be one of the most valuable trees ever introduced into Australia." Plants of it are grown at Kew for the decoration of the conservatory. Here it forms a copiously branched elegant shrub six feet high, not unlike the common C. racemosus, except that the branches are longer and stiffer and they are clothed in spring with paper-white flowers.

Camellias as hardy shrubs are receiving attention in the south of England, where they are proving as hardy as the common Laurel and as floriferous as the Pontic Rhododendron, so that the leading nurserymen in Devon and Cornwall are working up large stocks of them. At Kew they are hardy, and this year they are flowering well. C. re-

ticulata, the Pæony-flowered species from the mountains of Hong Kong, is thriving in the open against a wall. We have only lately awoke to the value of Azalea Indica as a hardy shrub, and the Camellia bids fair to accompany its countryman in its migration from the greenhouse to the open air.

[Those who have seen the great Camellias in the old gardens at Drayton Manor, near Charleston (see vol. ii., p. 129), can realize the splendor of these trees at flowering time in our southern states. The white Azalea Indica has proved hardy, with proper care, in the latitude of this city.—Ed.]

Rhododendron, Otto Forster.—This is a hybrid between Rhododendron Veitchianum and R. Edgeworthii, two of the most distinct of the Himalayan species. It was raised a few years ago by Mr. O. Forster, of Lehenhof, Austria, from whom plants of it were secured for Kew, where it is

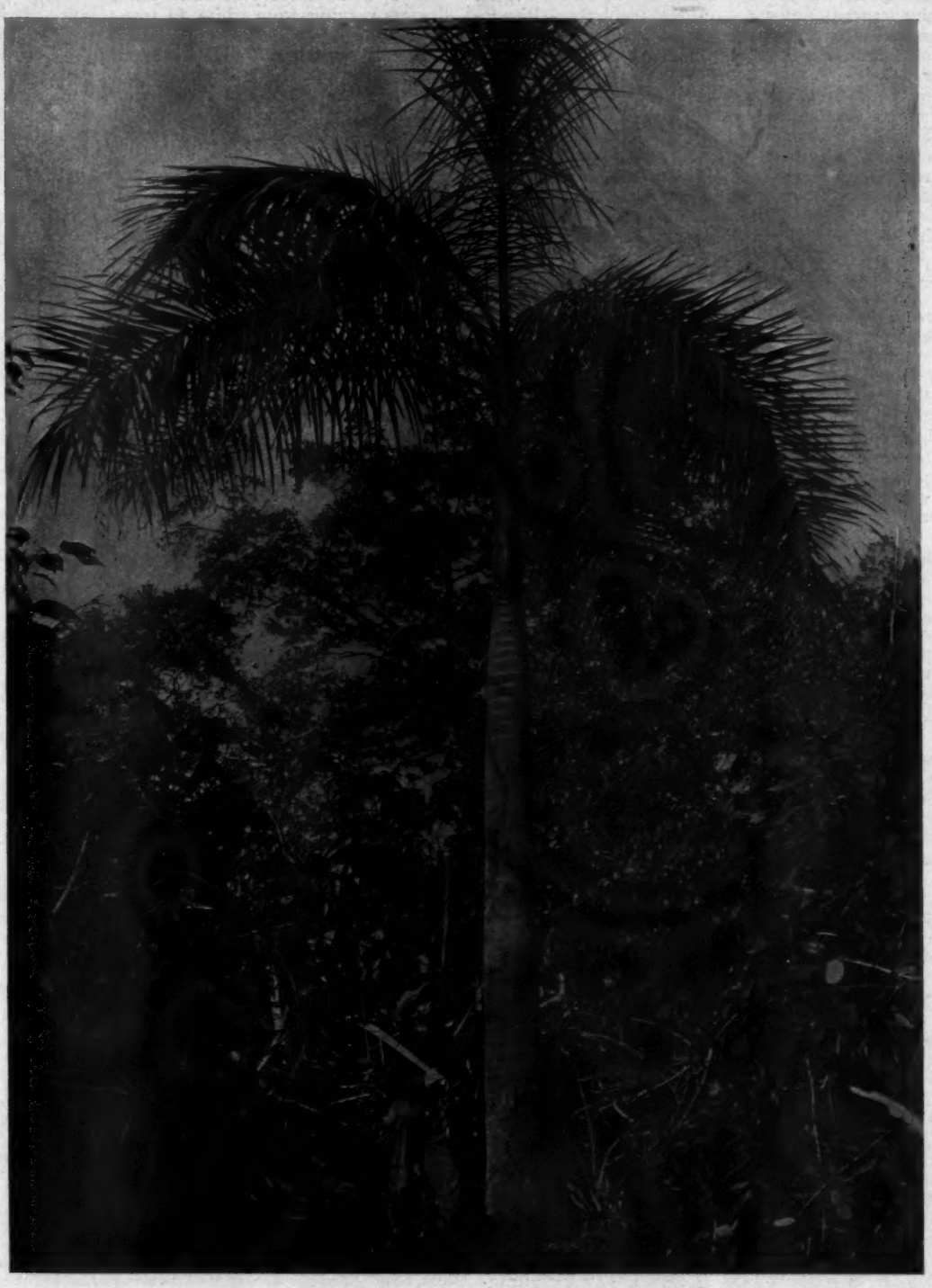

Fig. 21.—Oreodoxa regia, in Florida.—See page 152.

now in flower in the temperate house. It has inherited all the good qualities of the flowers of both of its parents and none of their bad qualities of habit. It forms a shapely shrub four feet high, clothed with dark green, wrinkled ovate leaves, and bearing loose clusters of large elegant pure white fragrant flowers. Among the hybrid Rhododendrons grown for the greenhouse I should place this by the side of Countess of Haddington, Henryanum, Kewense and fragrantissimum.

Rhododendron Nobleanum.—This and its near allies, Rhododendron altaclerense and R. Russellianum, all three hybrids between the Himalayan R. arboreum and forms of R. Catawbiense, have been beautiful here since the middle of January. They were raised in England more than fifty years ago, and for a long time they were in great favor, but they have long been supplanted by later-flowering hardier sorts. In a mild winter, however, such as the past has been here, they are a most attractive feature of the Rhododendron garden, the Kew plants, for instance, having been so full of beautiful flowers that horticulturists generally have wondered why such handsome winter-flowering shrubs are not in every garden.

Rhododendron fulgens.—This is one of the most beautiful of the Himalayan Rhododendrons and one of the hardiest. It forms a somewhat scraggy bush, six feet high at Kew, sixteen feet in the Himalayas, with smooth purplish bark, elliptic rounded leaves dark green above, the under surface covered with rust-colored tomentum. The young growths are enclosed in strap-shaped imbricating dark red scale-leaves. The flowers, which are bell-shaped, are in dense heads six inches across and each flower is about an inch across and of the brightest glistening blood-red color, unequaled in brilliancy by any other Rhododendron. I am informed that on the high mountains of Sikkim the effect produced by the numerous bushes of this Rhododendron when in flower is indescribably brilliant. There are several big bushes of it in full flower out-of-doors now at Kew. Unfortunately, there is a close resemblance between this species and the comparatively worthless R. campanulatum (æruginosum), except in the flowers, and this resemblance has led to the latter being generally grown for R. fulgens. So far as I know, this species has not been used by the breeders of garden Rhododendrons, although in its hardiness, rich color and time of flowering its claims are superior to other species which have.

Rhododendron præcox.—In favorable springs, such as that now being experienced in England, this Rhododendron is exceptionally effective, producing in great abundance its compact heads of rosy-lilac flowers in February and March. The habit of the plant is not unlike that of the Swamp Honeysuckles, and it resembles them in being practically deciduous. It is a garden hybrid between R. Dauricum and R. ciliatum, and was raised about thirty years ago by Isaac Davies, of Ormskirk, in Lancashire, to whose skill as a breeder of Rhododendrons we are indebted for some of the best in cultivation. R. præcox is as hardy as the hardiest of shrubs, and it a handsome bush when clothed with its glossy green Myrtle-like leaves. Its only drawback is its early-flowering habit, the buds unfolding in February, when they are often destroyed by frost. Where it cannot be grown out-of-doors permanently it is worth a place among greenhouse plants, a few bushes grown in pots in the open air during the summer and protected from severe cold till midwinter, when they may be started in a little heat, being very useful for the decoration of the conservatory in February.

Prunus Mume.—This plant, said to have been introduced from Japan into France twelve years ago, but as yet scarcely known in gardens here, is this year very attractive at Kew, the flowers being as large as those of the Almond, of the same color and deliciously fragrant. It is distinguished by the pale green color of its twigs, the long pointed Apricot-like form of its leaves, and its globose, slightly velvety fruits, containing oval convex stones. When in flower the shoots are quite leafless. It is quite hardy and flowers a fortnight earlier than its ally, P. triloba. The flowers are semidouble. It was distributed by Messrs. Baltet Brothers, Troyes, under the name of P. myrobalana flore roseo plena, and it has also been called P. cerasifera. The Japanese nurserymen offer named varieties of it, with flowers varying from white to rose-purple. It is said to force well.

Prunus dasycarpa, the Black Almond, is also flowering freely this year. It is supposed to be a garden hybrid. The twigs are black, and the flowers, which are an inch across, are white, with rose-tinted stamens and reddish calyx lobes. It seems to be a good, early spring-flowering tree.

Prunus triloba.—An old plant of the double-flowered form of this grand Plum has, for many years, been one of the principal attractions among trees which blossom in early spring at Kew. It is trained against a south wall, where it makes hundreds of wand-like shoots every year, each about a yard long and clothed from base to apex with clusters of rosy pink flowers over an inch across, double, beautiful both in bud and when fully expanded, their beauty being enhanced by the bright green of the budding leaves. It is impossible to speak too highly of this plant as a shrub for a south wall, for, although it is quite hardy and flowers freely when treated as an ordinary bush or tree, it is never so beautiful as when grown against a wall. The Kew plant is on its own roots. After flowering all the shoots are cut back hard, and this induces the plant to make long new shoots as above described. We have no more beautiful Plum from the east than this. It was introduced from China in 1857 and has been known in gardens as Amygdalopsis Lindleyi. Plants of the single-flowered form are also in cultivation, having been introduced from Japan by Professor Sargent a few years ago.

Spring-flowering Shrubs.—The exceptional mildness of the past winter, followed by an unusually warm and sunny spring, has made gardens here more attractive than I ever remember to have seen them. Shrubs of all kinds have flowered profusely and earlier than is their wont, while the spring-flowering herbaceous plants have been wonderfully good. That grand shrub, Forsythia suspensa, has been wreathed in golden flowers everywhere; Hamamelis arborea has been equally prolific in bloom. All our first comers, which generally get nipped in the bud with frost, have been a success, such as Rhododendron Dauricum, R. præcox, R. Rhodora (now beautifully in bloom), Corylopsis spicata, Magnolia stellata, M. Soulangeana, M. conspicua, Plums, Almonds, Peaches of all kinds, Prunus Davidiana, which is better than ever. Roses are in full leaf, and the Lilac bushes promise to be in bloom in a few days. With bright sunshine all day and a temperature of seventy degrees in the shade on several occasions and the entire absence of frost, such a state of things in the garden in March is not to be wondered at.

London. *W. Watson.*

## Cultural Department.

### Pruning Shrubs.

THIS is the season of frequent inquiry as to when and how deciduous shrubs should be pruned. To this it must be answered that the knife ought to be used at different times and in different ways, according to the object to be served, and that no branch should ever be cut away unless an intelligent reason can be given for removing it at that particular time. Every one ought to know that shrubs which bloom early in the spring form their flower-buds on the wood made the previous year, and that if this wood is removed now it will to that extent curtail the production of flowers. With a view, then, to the production of more flowering branches it is evident that such shrubs as the early Spiræas and Forsythias should be pruned as soon as the flowering season is over, and this will induce the growth of new wood, which will produce flowering buds for next spring. On the other hand, shrubs like the late-flowering Tamarisks and Hydrangeas should be pruned at once, if this has not already been done, in order to insure flowering wood for late summer and autumn, since these

plants blossom on the wood of the current year. But a shrub is more than a flowering plant. It is beautiful in summer for its foliage, and in the winter for its form and the tints of its branches, and it should be pruned, therefore, with a view to its continued use and beauty. Althæas and Tamarisks cut back to bare poles in the autumn have no beauty until midsummer of the following year. Severe pruning, as a rule, leaves a disfigured plant. Pruning shrubs to the form of a globe or a cone, or to a single level like a hedge is a horticultural atrocity. Remembering what has been said about the relation of the time of flowering to the time of pruning, it is best not to remove large branches to the extent of interfering with the typical outline of the plant. It is as good a time now as any to thin out the weaker and overshaded branches and those which interfere with each other. Of course, this will not supersede the necessity of summer pruning. Suckers and surplus wood can be removed in the growing season, when the wounds will heal more quickly than in cold weather or when the plants bleed. When the flowering wood is shortened in after the bloom is over the overstrong shoots can be stopped in midsummer without injuring the shapeliness of the shrub, and this will hasten the development of the flower-buds and help to ripen the wood into good condition for the winter. This is especially true in wet seasons. If the luxuriant growth is then stopped the vital energies of the tree will be turned toward developing buds and fruit.

Hartford, Conn. *G. A. Henry.*

## Growing Tomatoes.

ON page 37 of the present volume of Garden and Forest will be found a most instructive article on cultivating the Tomato, by Mr. W. W. Tracy, of Detroit, in which he called attention to the habits and surroundings of this plant in its native tropics. Under natural conditions, from the time the seed germinates until the plant is exhausted by bearing fruit, there is not any check in its growth from chill or other untoward circumstances, and it has consequently acquired a constitution which resents any check. When, therefore, the plants are exposed to a temperature of forty-five degrees they not only stop growing, but they lose vigor and vital energy, even although they are not killed. This indicates the true method of cultivation which was clearly described by Mr. Tracy—that is, a thorough preparation of the ground beforehand by frequent stirring; sowing the seed as late as from the first to the tenth of April; keeping the plants growing steadily in a good cold frame and not setting them out until cold storms are over, which is not much before June 1st in his latitude.

In the current issue of *The Rural New-Yorker* Mr. Tracy cites some instances to show that this most reasonable theory works well in practice. A field of Tomatoes in Oakland County, Michigan, treated in the usual way—that is, with the seed sown in March, planted in rich ground in such a way that they were checked for about ten days, after which they commenced a rapid growth, so that they soon surpassed in size the plants in an adjoining field from seed sown three or four weeks later and set out in ground that had been cultivated several times in such a way that they received no check. In spite of the vigorous growth of the stalks and leaves, the first field yielded less than three hundred bushels to the acre, and the second yielded about eight hundred bushels of excellent fruit. Of course, there were differences in cultivation. For example, the second field was cultivated every week, and sometimes oftener, and care was taken to stir the surface only, while the other field was cultivated three times, as deeply as the implement would run. Nevertheless, this will not altogether account for the difference in the yield, and it appears plain that Mr. Tracy's suggestions will be found very useful to all who study them so that they can adopt the practice understandingly.

New York. *S.*

## Asparagus.

NO early vegetable is looked for more eagerly than the first dish of asparagus. A bed of Asparagus once established is permanent, and it is essential, therefore, that the work of preparing the bed should be done thoroughly. A well-drained sandy loam is best. Our location is a dry one, but we have never known the bed to suffer even in the driest season. In heavy soils some artificial means must be adopted to relieve the soil of excessive moisture. Where Asparagus is grown in the lowlands it is customary to cultivate it on ridges six feet wide, three rows to a ridge. The intervening hollows, or trenches, are filled during summer-time with the litter gathered from the manure which has lain on the ridges all winter. When thoroughly decomposed this is thrown up again, with an additional dressing, and the trenches again left open during the winter. This plan will be a good one to follow in all heavy soils, and in such cases there is another advantage, that of having earlier Asparagus than could be grown in beds on the level. The beds being permanent, the ground must be deeply trenched with good loam to take the place of poorer soil. Six inches of good manure should be worked in deeply, as Asparagus-roots penetrate the ground for fully two feet, and this also is a safeguard against drought. It is not, however, recommended to make the plantation deep. Our original bed is now twenty years old, but it is equal in bearing and quality to plantations six years old. It is later, and this may be accounted for by the fact that crowns are yearly formed below, or behind, the main one, so that now the original roots, once near the surface, are from fifteen to eighteen inches deep.

Travelers in Europe often remark on the succulent quality and delicate flavor of asparagus as served in Paris, comparing American-grown as stringy and coarse-flavored. The French method of culture, to which alone is ascribed the excellent quality of the vegetable there, is described in Robinson's *Parks and Gardens of Paris*. A planting was made here six years ago according to the instructions given in this book, and with most interesting results. Trenches four feet apart were dug to the depth of six inches and the soil well pulverized. All along these, at three feet apart, mounds were made a foot in diameter and six inches high. The young plants were placed with their crowns on the top of the mound, and the roots spread in all directions along the sides, and finally banked up even with fine soil. This method of handling the roots is of considerable importance, and may be followed to advantage in any case. Regular development is insured, and the results in our case were surprising. It certainly is a more rational way than bunching the roots or squeezing them into holes that are not large enough for them.*

Each season the stems have been stayed with stakes to prevent the unavoidable injury from wind, liable to unprotected plants. In a closely planted bed this would not be necessary. Care was taken that these stakes were inserted far enough away not to injure the crowns. All seed capsules were picked off and everything done to secure the fullest development of the crowns. One, two, three years passed, and the hills were banked with fine soil to bleach the pushing shoots. But something was wrong, for the grass was stringy and tasteless, and the French method was abandoned. Nevertheless, for private gardens, whether one wants it blanched or not, finer and better asparagus can be grown in this than in any other way, and we would recommend it to all.

When the cutting season is past, which is usually when peas come in, we have given an additional coat of salt with no injury to the growing plants and with advantage in destroying millions of small weeds. There is an excellent artificial manure, specially prepared for top-dressing. In city gardens this will be preferable to barnyard manure.

Asparagus roots are sometimes lifted in the autumn and forced under benches in the greenhouse during winter. The results are seldom satisfactory, and the shoots are at best weak, stringy and tasteless. The plan adopted at the place of H. H. Hunnewell, Esq., and now in good practice, after several years' preparation, is to mark a bed out, which can be framed over when ready to force, and cover it with hotbed sash. The bed is enclosed in the autumn, well matted and shuttered and banked, so as to exclude frost. When February comes, sunlight and air are allowed on all bright days, so that by the middle of March good, natural-looking heads push through, and these are as well flavored as any we get at any time. Cutting is continued until the open-air crop is well in, and then the bed is allowed to take its natural course.

Wellesley, Mass. *T. D. Hatfield.*

**Hovea elliptica.**—New Holland plants are unfortunately little known or they would be very highly appreciated, and none more so than this one. The Hoveas are much like Chorozemas in many respects, but differ generally by having intensely purple or blue flowers. H. elliptica is of a rather straggling habit that can be improved under cultivation by means of pinching and pruning. The leaves are rather small, alternate, rounded-lanceolate, mucronate. The intensely blue and very beautiful flowers are produced in short axillary racemes in great profusion from March until early summer. The stems are very slender, with somewhat hairy branches, and grow a couple of feet high only, under cultivation. Hoveas are generally propagated by seeds, which grow freely when fresh. They

* The method of cultivating Asparagus in France was explained with great fullness by Monsieur Henri L. de Vilmorin, in Garden and Forest, vol. iii., p. 557.

should be sown in shallow pans in a compost of fibrous peat, loam and sand and kept in a warm and shady position until germinating. Watering should be attended to regularly and with great care, as the young seedlings are apt to damp off if the roots are kept too dry and the top too moist. The seedlings should be pinched frequently to form bushy plants, and kept in a moderately cool and light place in summer. In winter they thrive best in a warm greenhouse or conservatory.

Washington, D. C. *O.*

**Mahernia glabrata.**—This is a very desirable greenhouse plant, flowering from March until early in summer. It has a rather straggling habit, but can be grown into a neat and compact specimen by proper pinching and training. The Oxalis-like flowers are yellow, nodding, very fragrant and borne in pairs on long axillary or terminal peduncles chiefly on lateral branches; leaves lanceolate, pinnatifid, or coarsely toothed, and the stems are slender and wiry. The plants when well grown are very floriferous, and, although not among the showiest, they are, at least, among the sweetest greenhouse and window plants of this season. After flowering they should be allowed to rest and ripen, and any long and straggling shoots may then be pruned back. They should afterward be repotted and plunged during the growing period outside in a cool frame. Plenty of water is necessary in summer. In winter they should be kept quite cool until February or March, when a warm and light place near the glass is preferable to any other. Mahernias are generally increased in summer by means of cuttings of soft-wooded lateral shoots, which will strike in a cool propagating-bed in a temperature of about sixty degrees.

**Kennedya (Maryattæ) prostrata major.**—Few twining greenhouse plants can surpass this showy species, which flowers very freely in March and April in a cool conservatory. It is the only really valuable and floriferous greenhouse climber among the Leguminosæ, and it deserves wide and general cultivation for its graceful habit and beautiful flowers. Like all Kennedyas, it is a perennial herbaceous twiner, a native of Australia, where the genus is indigenous. It differs from K. prostrata in having lighter-colored and larger flowers, in the more rounded and hairy leaflets, and in being profusely floriferous. The trifoliate leaves are very handsome, with roundish oblong wavy-edged leaflets about two inches long. The slender stems often grow as long as twenty feet and carry numerous axillary clusters of intensely deep scarlet flowers. All the green parts of the plant, stems and branches, as well as the foliage and stiples, are very hairy. All the Kennedyas are readily propagated from seeds, which ripen in any moderately warm and sunny position. They should be sown as soon as ripe in a light compost, and may be grown out-of-doors during the first season. They grow very rapidly and require an abundant supply of water in summer, but may be kept considerably drier in winter. They are best planted out in prepared beds in sunny positions in the conservatory, where they can be trained on pillars and rafters, producing the most beautiful effect in spring and early summer.

Newark, N. J. *N. J. Rose.*

## Correspondence.

### The Plans of Madison Square.

To the Editor of Garden and Forest:

Sir,—All persons interested in park-making will certainly be grateful for the two plans of Madison Square in your last issue and the study of their comparative merits by Mrs. Van Rensselaer. Perhaps still further discussion may be helpful, and I therefore write to say that it is hardly correct to classify the old plan as belonging to the naturalistic class. I draw a heavy line (see fig. on this page) to show how symmetrical it is except where it has been distorted in two or three places. Curved lines are not necessarily natural. Of course, the building (C) ought to be less conspicuous than it is, and the revised plan corrects this. Plainly, too, the statues are introductions of a later date, and the original designer is not responsible for placing them where they are. They might be well removed to the points (NN). If this were done I do not discover any great superiority in the proposed plan over the old one. The area is so small that the insertion of a bit of rectangular treatment surrounded by a curvilinear treatment seems incongruous. Nor is it large enough for a "variety of design, abundance of shade, an effect of wide green lawns with seemingly unstudied, yet artistic, arrangement of trees, shrubs and grass, which produce pleasingly naturalistic impressions and illusions." An attempt to accomplish all this in so contracted a space must result in confusion. Let us have symmetry where this is needed, but curvilinear symmetry and rectangular symmetry ought not to be mixed up in so small a place.

Mrs. Van Rensselaer has noted one serious mistake in the new plan—that is, the sharp points in the grass-plats—and she might have added that the few conifers introduced tend to

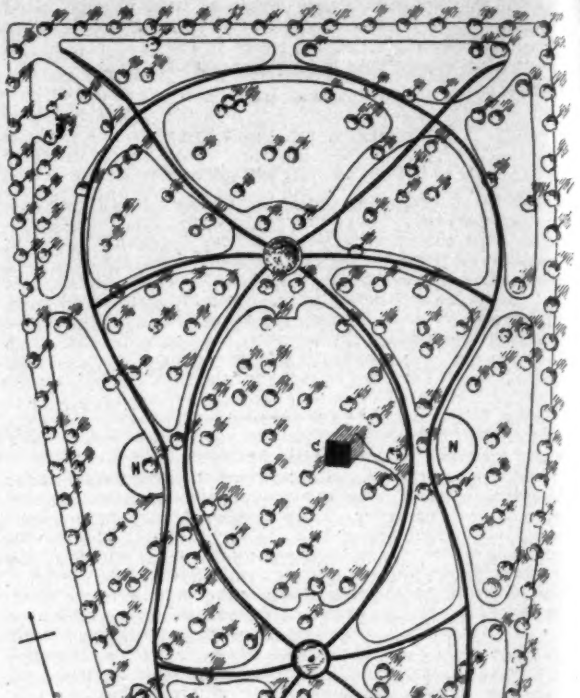


Fig. 22.—Plan of Madison Square, New York.

spottiness. Again, instead of dividing the rectilinear garden by a short straight avenue of trees running from circle to circle, would it not be better to surround and frame in the flower garden with them rather than bisect it? Perhaps trees are not needed at all, for the flowers need all the sunshine they can get. Mrs. Van Rensselaer is certainly right when she states that parks in restricted areas had better be formalized. But the central oval of the original plan might be adorned with flowers as advantageously as the central feature of the proposed plan, and the trees about this oval might be placed symmetrically and at even distances if it was thought proper to emphasize the symmetry of the centre of the place; and this would be advisable if the monuments were placed at the points (NN). Undoubtedly the trees in the old plan should be better grouped, or set in some symmetrical relation, and some symmetrical shrub arrangement is needed especially outside the central oval. With proper grouping of the trees symmetric places might be found for formal flower-beds and balanced sites for statues. Altogether, if there could be some rearrangement in the planting to make the symmetry of the present plan more evident, it strikes me as better than the new ones.

I should be greatly pleased to hear some other opinions on these points, and trust that some artist will furnish you with other plans designed without any regard to the square as it now exists. Messrs. Bell & Langton have been hampered by their efforts to save standing trees, so that they were allowed very little freedom of treatment, and it is not fair to criticise their plan as an original work.

New York City. *S. A.*

To the Editor of Garden and Forest:

Sir,—I observe that in both plans of Madison Square, published in your issue for April 8th, the paths which converge at

the circles are very inaccurately centered—that is, the axes of the paths do not point to the centres of the circle, and if the designs were executed as shown on the map the result would be disastrous. This, however, may be simply carelessness on the part of the draughtsman. I should add that both plans ought to show greater seating capacity. Seats ought to be recessed so that the feet of those using them will not be in the way of pedestrians, because the paths as wide as those in the plans give no more than the necessary walking space.

New York. *L. G. S.*

## Meetings of Societies.

### Forestry in Pennsylvania.

A NOTABLE event was the spring meeting of the Pennsylvania Forestry Association and Arbor Day celebration, which occurred in Philadelphia on Friday, April 10th, with the coöperation of the trustees and faculty of the University of Pennsylvania and the trustees and faculty of the Drexel Institute. The planting ceremony comprised afternoon exercises in the chapel of the University of Pennsylvania. Perhaps so enthusiastic an audience never before assembled in the interests of forestry in America. The Governor of the commonwealth, Mayor of the city, Provost and faculty of the University, chief of the National Forestry Division, the State Forest Commissioner, the president of the Pennsylvania Forestry Association and other public officials, the members of the Pennsylvania Forestry Association and friends of forestry and of the University made up part of the audience, but the impressive feature of the great gathering was the hundreds of earnest young men, students of the University. The spontaneous ringing applause when telling points were well made by the speakers was doubtless inspired by patriotism sometimes as much by protest against the wasteful destruction of forests or the proposal of forest reform, but the effect in the direction of wiser forestry policy was none the less strong on the minds of the audience.

Provost Harrison, in opening the meeting and giving it into the charge of Mr. John Birkinbine, President of the Pennsylvania Forestry Association, said that Pennsylvania once had the greatest relative forest area of any of the colonies north of Virginia, and now has the least relative forest area of the states north of Virginia, excepting Connecticut. Mr. Burkinbine explained that his interest in forestry was aroused in connection with the hydraulic and metallurgical factors in railroad building. Governor Hastings was then introduced, and spoke, among other things, of the far-seeing wisdom of Penn, who aimed at the planting and preservation of the Oak-trees for ships and of the Mulberry-trees for silk; of two rows of trees along every street of the city, and the clearing of only five out of every six acres of forest by the settlers. Mayor Warwick's fancies and facts completely captured the audience. He said much of Shakespeare's poetry was due to his having yielded to the influence of nature in the Stratford and Coventry country.

Professor Rothrock, State Forest Commissioner, then read a letter from General Paul A. Oliver, of Wilkesbarre, giving a history of the scion of the Penn Treaty Elm, to be planted in connection with these exercises on the University campus, as a memorial to William Penn. Some account is already recorded in GARDEN AND FOREST, vol. v., p. 312, and vol. viii., p. 240. The little tree to be planted now was taken from a shoot of the Oliver tree on the 1st of March, 1893. Nathan C. Schaefer, Superintendent of Public Instruction, made an effective address, and, describing the love of German students for trees about their alma mater, called upon the loyalty and care of the students of the University of Pennsylvania for this historic grandchild of a great tree.

Mr. Fernow, representing the National Government, said that the American people had made two great mistakes, one moral, the other economic; one in the treatment of the Indians and the other in the treatment of the forests, and that Penn, in whose memory this tree is to be planted to-day, made neither of these mistakes. He said the planting would be a memorial of moral rectitude and advanced national economic thought.

The planting of the trees on the campus facing the main hall then followed, Governor Hastings doing the actual planting. In the name and by the authority of the commonwealth of Pennsylvania, the Governor commanded Provost Harrison and the University generally to care for the tree. The Provost accepted the trust, and promised also that trees would soon be planted along the entire three miles of streets surrounding the University, the plans for the work being already in hand.

At the evening meeting, in the Drexel Institute, the first address was that of Governor Hastings, who spoke on the necessity of preserving the forests of Pennsylvania. After sketching graphically the original extent and wealth of our unbroken Appalachian forests which stretched from Maine to the Gulf, he showed how rapidly these had melted away before the axe of settlers, whose descendants were continuing this destruction while other nations had been taught by a disastrous experience to begin with infinite pains and cost the work of forest restoration. Leaving aside the broader economic and sanitary value of our forests, he quoted figures to show that the annual product of our forests was fifteen times as great as that of all our gold and silver mines, and more than double that of all the minerals as well as the natural gas, and slate and building stone which are dug from the earth in a year. Coming to his own state, he said that during the last ten years the timber crop of Pennsylvania had aggregated more than two hundred millions of dollars. Three-fourths of the timber in the state had already been marketed, the railroads had invaded the woods where streams were not large enough to float the logs, and the portable sawmill was making havoc with the smaller growth on the hills and the wood-lots on the farms. He gave Commissioner Rothrock as authority for stating that if the land in Pennsylvania unfit for farm purposes, and now worth not more than $1.00 an acre on an average, could be protected from the axe and the brand, the value of the timber crop on this land at the end of fifty years would be a billion and a half of dollars, or an average of thirty million dollars a year, and this estimate makes no account of the saving of life and property from frequent floods, or of the improvement to agriculture and other industries and the promotion of the public health, which would certainly follow. He asserted that these tremendous interests make it the essential duty of the commonwealth to restore and protect the forests on the highlands of Pennsylvania wherever this is possible. This great waste forest area should be under proper guardianship and no interest of such public importance should remain in private hands. It was the welfare of the people at large, pure water, public health, which forest destruction threatened. Altogether the Governor made a strong and reasonable plea for state action in the interest of the state at large.

In the course of a very instructive paper, Mr. B. E. Fernow, head of the Forestry Division of the Department of Agriculture, said that there are two points of view from which we may look at the forestry movement: first, the one which a thinking lumberman and forest-owner ought to take when he considers only the perpetuation of supplies of useful material which the forest can yield, and, secondly, the broader one which the statesman and every patriotic citizen is bound to take in addition to the first—that is, he must consider the rôle which the forest plays as a factor in our civilization, as a general condition of the country which, if irrationally altered, must lead to the misery of the whole community. The influence of the forest upon the conditions of river-flow, climate and health can rarely concern the private owner who is interested only in the profit which he can draw from his property, and this is the reason why the state, which alone is as long-lived as the forest, should guard the essentials of its future welfare. The questions relating to our forest are not those whose adjustment can be deferred without detriment. Whether our currency be of silver or of gold, whether our tariff be high or low, whether our products are carried across the sea by English ships or by our own merchantmen, are matters which can be decided in the future; but whether fertile land shall be turned into deserts, forests into wastes, brooks into torrents and rivers changed from means of intercourse and power into forces of desolation—these are questions of immediate importance which must be solved at the proper time. Mr. Fernow went on to show the particulars of the devastation of the French Alps and of the efforts to recover them. He explained that the same processes are wasting the fertility of our own territory, where vast regions are doomed to impoverishment unless we begin at once to arrest the loss. He advocated strongly the passing of the McRae bill, now before Congress, which, although crude and primitive, is, at least, a definite and reasonable attempt at a rational forestry system for the property of the General Government.

Dr. Rothrock, State Commissioner of Forestry, followed with some well-selected lantern views illustrating the conditions of the naked hills and water-sheds of the state. One of these showed a scene in Sullivan County where ridge stretched beyond ridge for miles covered with an unbroken forest, making a natural sanitarium, and this was contrasted with another which was a scene of absolute desolation where the hills had been first lumbered over and the remaining trees destroyed by fire. Two beautiful pictures from Centre County showed the sources of streams in timbered regions where water was saved for the state use, and two others from Clinton County showed scenes of ruin, where the water had rushed off in a

deluge from the naked hills, destroying life and property in its course. Instructive, too, were the contrasting illustrations of what a street-tree ought to be, and of an actual scene in one of the Philadelphia squares, in which trees unsuitable for a city planting had been selected and then butchered by an ignorant pruner.

All the addresses were wise and temperate, and the exercises throughout were instructive and stimulating, just such exercises, indeed, as are needed for popular education in all parts of the country.

## Notes.

Plums proved the least satisfactory of all fruit crops in western New York last year, and the reason assigned was that the crop of 1894, the largest ever known, proved such a drain on the vitality of the trees that they did not have strength enough for a crop the succeeding year. A marked exception to this rule was found in trees of the old variety Reine Claude, which gave a full yield of as large and fair fruit as ever.

Of the vegetables imported into New York during last week, Bermuda sent 14,068 crates of onions and 1,346 crates of other vegetables; Cuba, 2,366 crates of onions and 440 crates of other products; the Bahamas, 871 crates of tomatoes. Other receipts from the south were 4,600 barrels of kale, 12,700 barrels of spinach, 7,750 crates of cabbage and 5,100 crates of other vegetables, while 8,500 packages came over the Pennsylvania Railroad. Of course, this is only a partial record of the supply.

Strawberries from Florida have been quite abundant, but the fruit is of irregular size and quality, though in fair condition. Some Hoffman seedlings of extra grade have come packed in ice boxes and sold at fifty to sixty cents a box, at retail. In other grades those carried in refrigerator cars have shown the best average quality, and prices have been thirty-five to forty-five cents a box at retail. Other methods of transporting this perishable fruit are in freight lots in small ice boxes and by express in open crates.

Bananas are in plentiful supply in this city and sell rather slowly. During last week 49,900 bunches were imported here, against 63,500 bunches during the corresponding week a year ago. They sell for eighty-five cents to $1.35 a bunch on the docks in truck-loads. Cocoanuts, also, are plentiful—a cargo of 398,000 from St. Andreas having arrived a few days ago, besides the large stock on hand. San Blas, St. Andreas, Baracoa and Kingston are the forwarding ports, and prices here range from $24.00 to $30.00 a thousand.

A very complete handbook on Indian Corn is contained in the report of the Kansas State Board of Agriculture for the quarter ending March 31st of this year. It fills more than one hundred pages, and has been written by experts in the various fields, and contains a surprising amount of information upon such points as cultivating and handling the crop, harvesting and storing the fodder, the merits of different varieties, the feeding value of the meal, diseases of the plant, etc. This is followed by a briefer treatise on the Sorghums and their use both for grain and for forage as estimated by Kansas growers. It is a useful little pamphlet, and yet the Secretary of the Board of Agriculture has not found it worth indexing.

Some time ago we gave a brief description of Physalis Franchetti, a near relative of P. Alkekengi, often seen in old gardens, where it is called the Winter Cherry or the Strawberry Tomato, on account of its well-flavored fruit enclosed in the swollen calyx. The new species was brought recently from Japan by Mr. Veitch, and from a colored plate of it in the last number of *The Garden* it must be a striking plant. The calyx is about seven or eight inches in circumference and of singularly glowing colors—a mingled orange and scarlet of varying tints. A group of these plants grown in deep soil would give a rich and bold effect, and when cut the inflated envelope of the fruit lasts for a long time. A correspondent of *The Garden* says that some of these fairy-like balloons are still bright, although they have been cut more than a year.

Along some of the more public business streets of Philadelphia, on market day mornings especially, interesting little collections of woodsy herbs are offered for sale by colored folks from out of town. One such little sidewalk-stand last Saturday offered bunches of the spicy leaves of the Creeping Wintergreen, or Checkerberry, which lacked the gloss, but were almost as varied and brilliantly colored as Galax leaves. Calamus, slender Sarsaparilla roots and the thicker Dandelion roots, with the bark of Wild Cherry, Sassafras and Prickly Ash, all sold for some asserted medicinal value. Then there were fresh Catnip, clumps of the grassy young foliage and roots of Star of Bethlehem, leaves of Dandelion for salad, little nosegays of Trailing Arbutus, and plants of the same well rooted in the glistening sand of The Pines of New Jersey, and patches of moss. There were plants of Peppermint, too, the straggling, nearly bare, stems showing little green and purple leaves on the ends.

We have alluded to the danger which threatens Niagara Falls since several great corporations, eager to secure power for nothing, are struggling for the privilege of taking water for their private use from what is now a public stream. Attention has also been called to the fact that surveys by the Government Engineer seem to show that the level of the Great Lakes has fallen within the past twenty years, and is still falling, and it is interesting to inquire, therefore, what will be the effect of the great Chicago drainage canal in the same direction. The Niagara is the outlet of the lakes, and any lowering of their level will, of course, be felt at the Falls. *The American Architect* doubts the propriety of draining a navigable lake for the purpose of floating the sewage of a city down upon the people of southern Illinois and the states below. But, besides this, the whole country has an interest in the Falls of Niagara, which will be affected, no one seems to know how much, by the Chicago canal.

According to a recent publication of the Department of Agriculture on Nut Culture in the United States there are about 250,000 Cocoanut Palms of all ages on the eastern coast of Florida, some 25,000 of which are bearing. On the shores of Lake Worth some 50,000 trees, old and young, are now growing, and nothing can be more picturesque or graceful than the soft, yellowish green leaves of these groves. Many of the leaves are as much as twenty feet long and as perfect throughout as an ostrich plume. Florida growers bury the nuts until they sprout, and then plant them in holes some two feet deep and twenty feet apart. The sprouted nuts are covered with good earth, and as the plant grows the earth is filled about it until it is level with the surface. The tree is fruitful near the salt water in Florida south of Lake Worth on the east, and Charlotte harbor on the west, including the keys. It begins to fruit in from five to seven years from the planting of the nut, but when removed inland it is not fruitful and does not thrive. On Key West there are some trees over fifty years old.

In Bulletin No. 40 from the Oregon Experiment Station, we learn that for commercial purposes there are practically only seven varieties of Apples grown in that state. Of these the Spitzenberg is the most generally planted and the best liked, and this is followed in the order of their acreage and reputation by the Ben Davis, the Newtown Pippin, the Baldwin, the Red-cheeked Pippin and the Northern Spy. The first orchards which were planted as minor appendages to farms where the fruit was only grown for home use have been allowed to be preyed upon by various pests until they are nearly valueless, so that the orchard area has actually decreased in recent years. New orchards are now being planted on a considerable scale, and organized efforts have been undertaken to combat the insects, of which the San José scale, the green aphis and the woolly aphis are the most serious pests, and the latter can hardly be annihilated since it lives both at the root and the top of the trees. On the branches the woolly aphis can be controlled by caustic washes, and it is to be hoped that some variety of Apple will be found with roots that can resist its attacks.

It has long been a common opinion among farmers in this country and in Europe, that where seeds are produced in pairs one of these will germinate the first year after ripening, and the other will not germinate until the second year. Experiments with the seed on a spikelet of Wild Oats, Avena fatua, and the Sandbur, Cenchrus tribuloides, have shown that there was no foundation for this belief, but with the Cocklebur, Xanthium Canadense, it has been discovered that the germination of both seeds in a pair in one season is exceptional. Very interesting are the details of some studies by Professor J. C. Arthur as given in a paper read at Springfield, Massachusetts, at the last annual meeting of the Society for the Promotion of Agricultural Science. He proved that neither of the two seeds had the advantage over the other in any physical protection, but he discovered at last that there was a constitutional difference in the character of the protoplasm of the embryos, so that one seed has a short resting period and the other a very long one—that is, the seeds are distributed in time, one of them germinating a year, at least, later than the other, instead of being scattered in space.